

Smart Germans in the Survey and Washington

John Cloud

NOAA Central Library

The Coast Survey: The Oldest Scientific Agency in the Govt.

- 1807 Founded by Ferdinand Hassler
- 1848 Revolution in Germany
- 1849-50 Adolph Cluss works for the Survey
- 1858-65 The Survey in the Civil War
- 1878 The Coast and Geodetic Survey
- 1917-18 World War One
- 1970 The Survey into NOAA
- 2007 200th anniversary of the Coast Survey

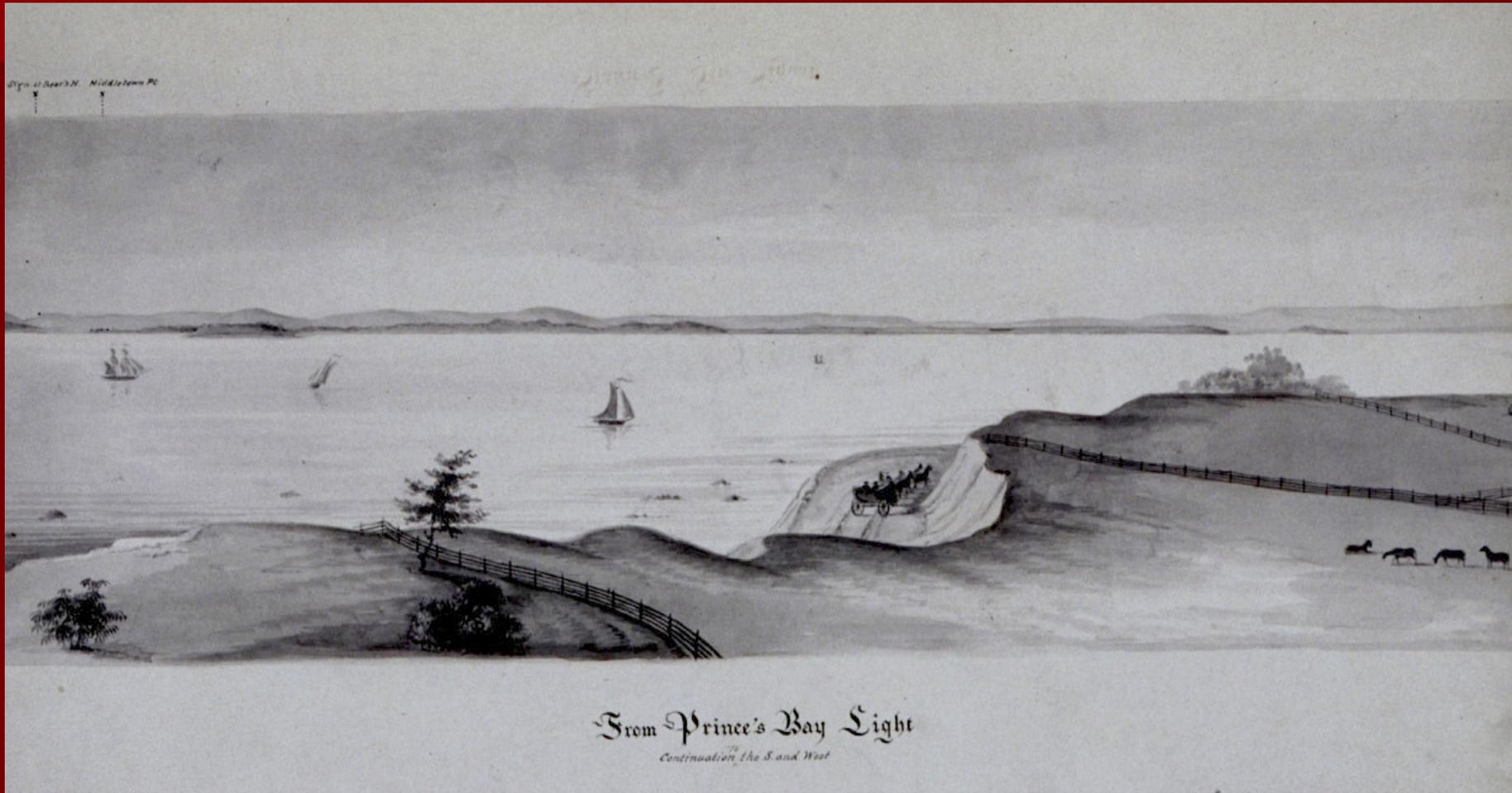
The Founding German (-speaking citizen of Switzerland)



Ferdinand Hassler's Foundation

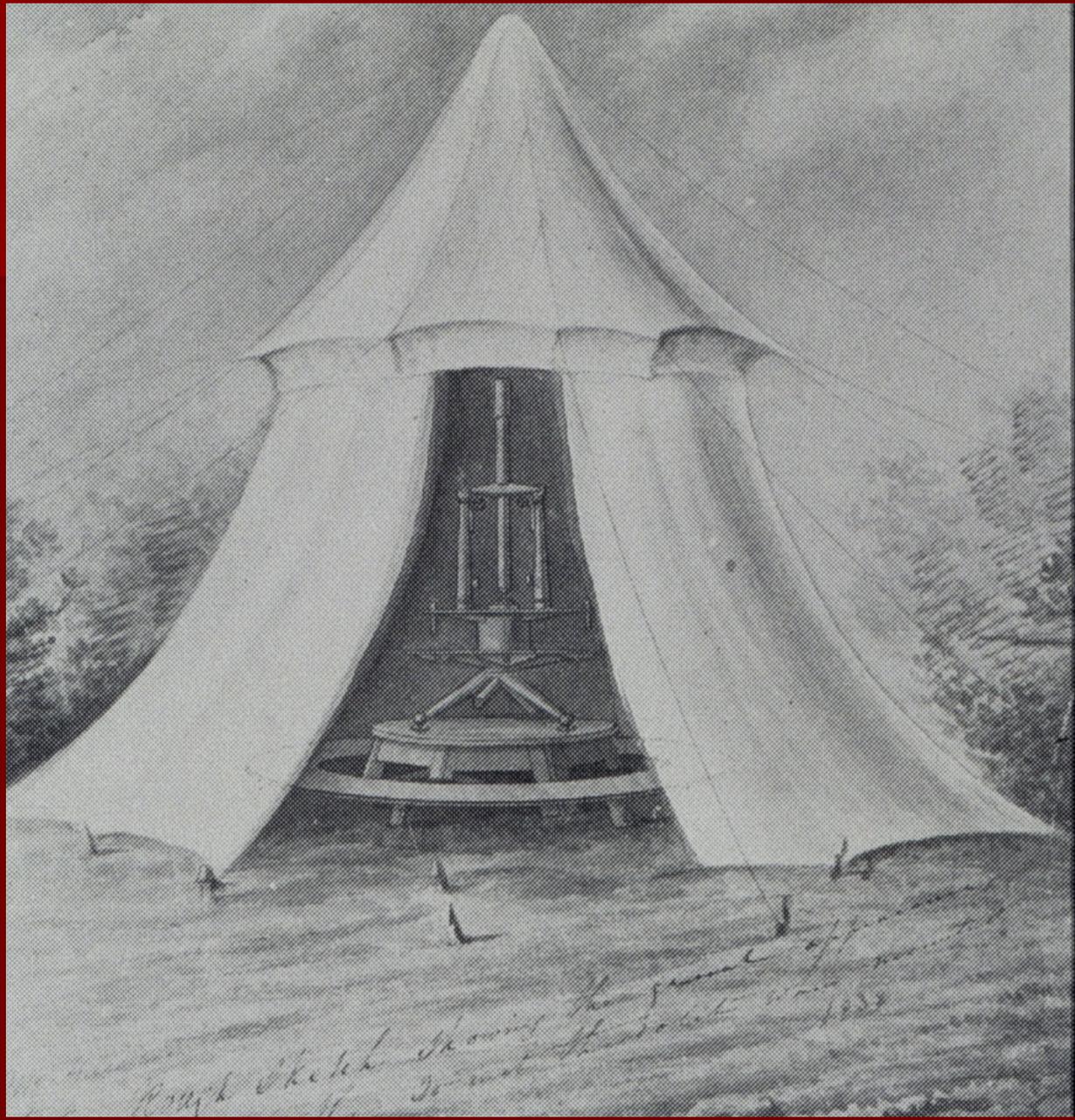
- 1807 Jefferson's acceptance of Hassler's Idea of the Survey
- 1810 Teaching Mathematics and Geodesy at West Point
- 1811-15 To Europe for instruments
- 1816 Field Work begins
- 1843 Hassler's death, and the transition to Bache

The Original Coast

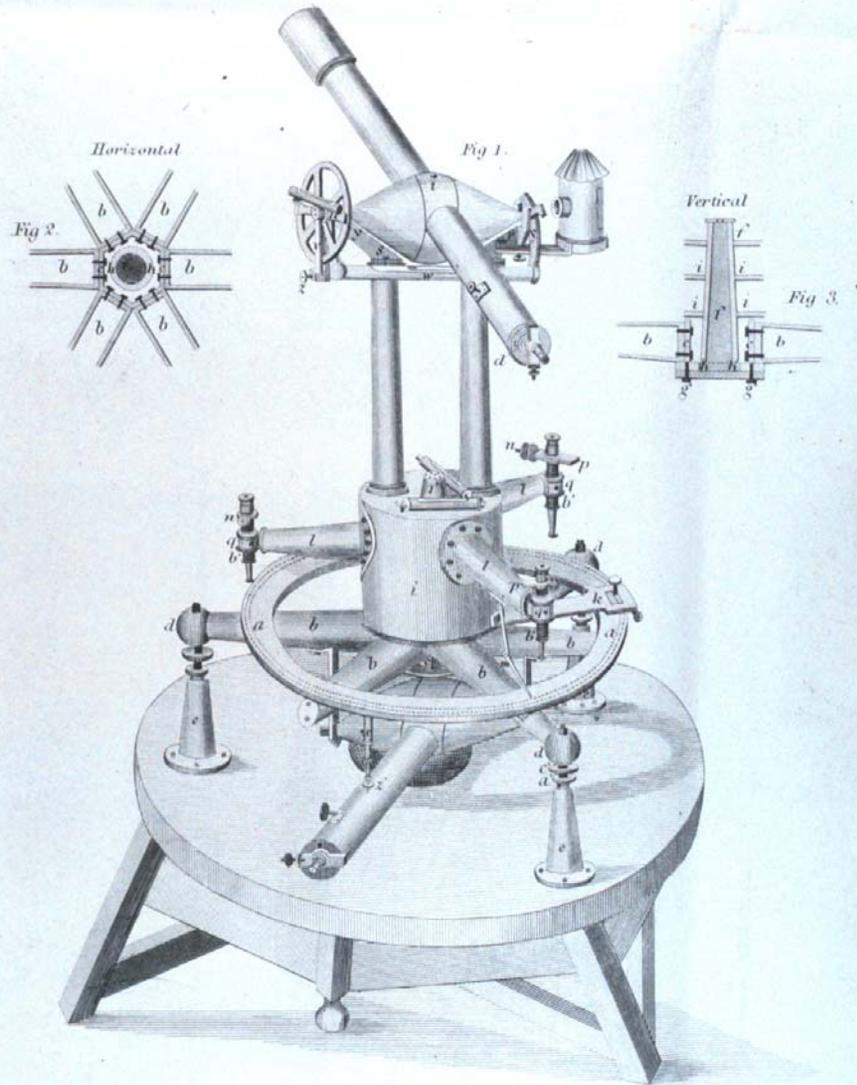




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Rough sketch showing the ground of
30 inch theodolite
1882



Caroline Haasler Del.

Engraved by J. Hager Philad^a

Eaton's Neck light

L o n g I s l a n d

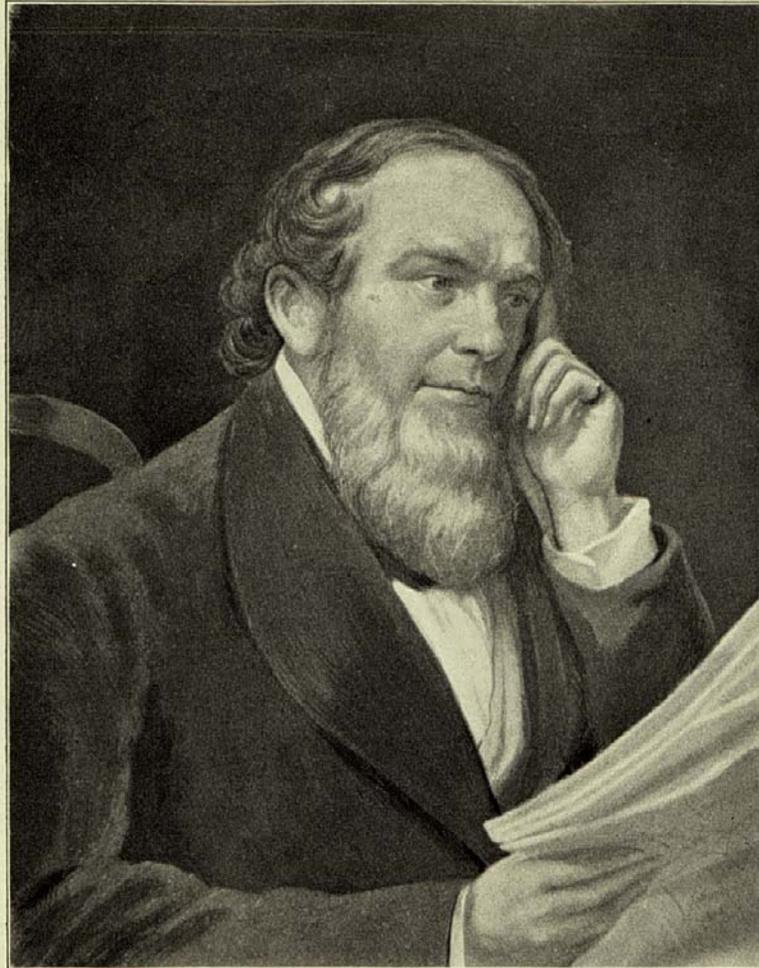
Normal



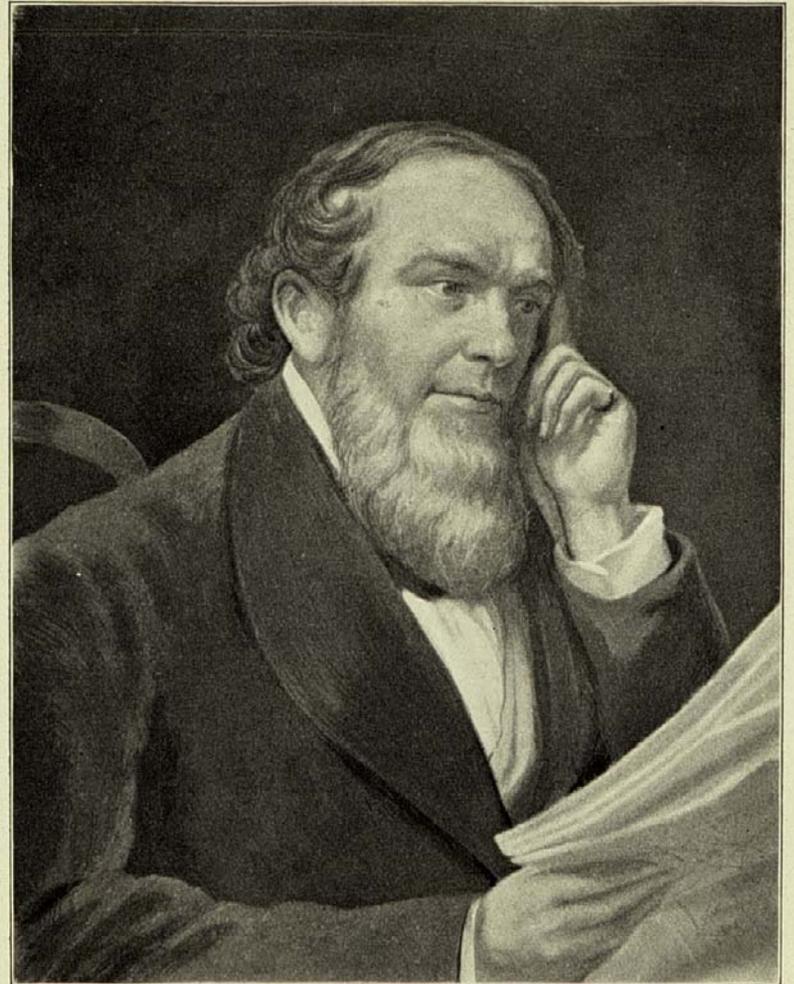
From Stony hill N. England

Westly View

A. D. Bache built upon Hassler's Foundation



Professor Alexander Dallas Bache



Professor Alexander Dallas Bache



Bache and Intercontinental Science

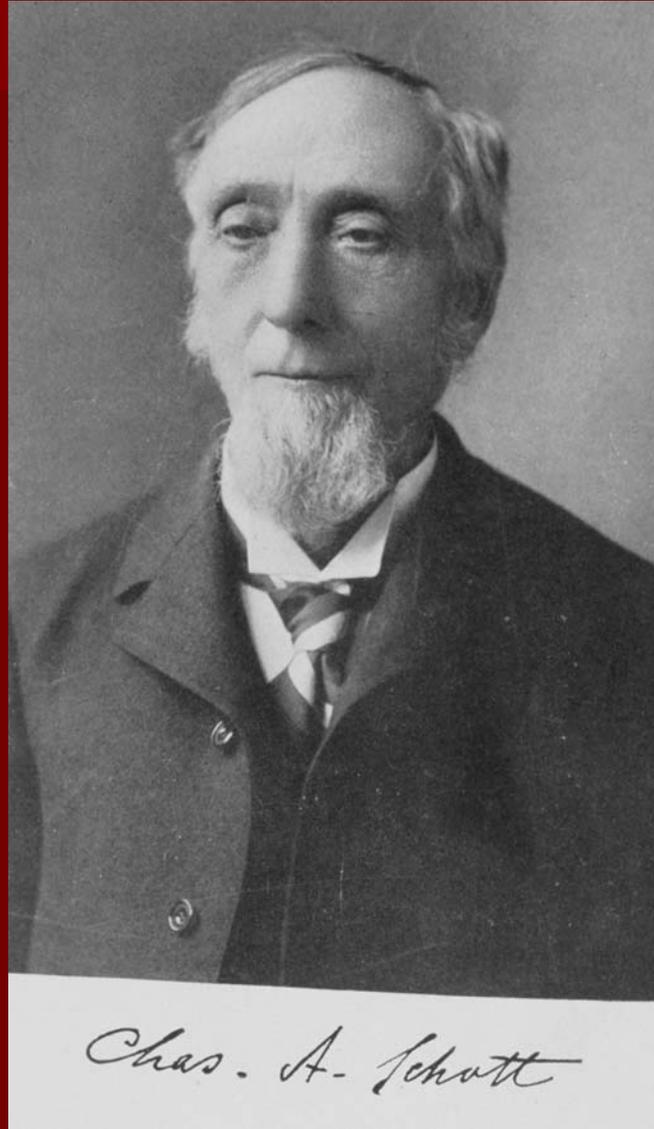
- Born 1806
- 1821-25 West Point, then into the Army Corps of Engineers
- 1828-35 University of Pennsylvania
- 1836-38 In preparation to head Girard College, toured Europe and its educational systems and published “*Report on Education in Europe, to the Trustees of Girard College for Orphans*”. 8 volumes. 666 p.
- 1839-42 Central High School, Philadelphia
- 1843 Hassler died. Bache succeeded him as head of the Survey.

The Primary Triangle of 1848

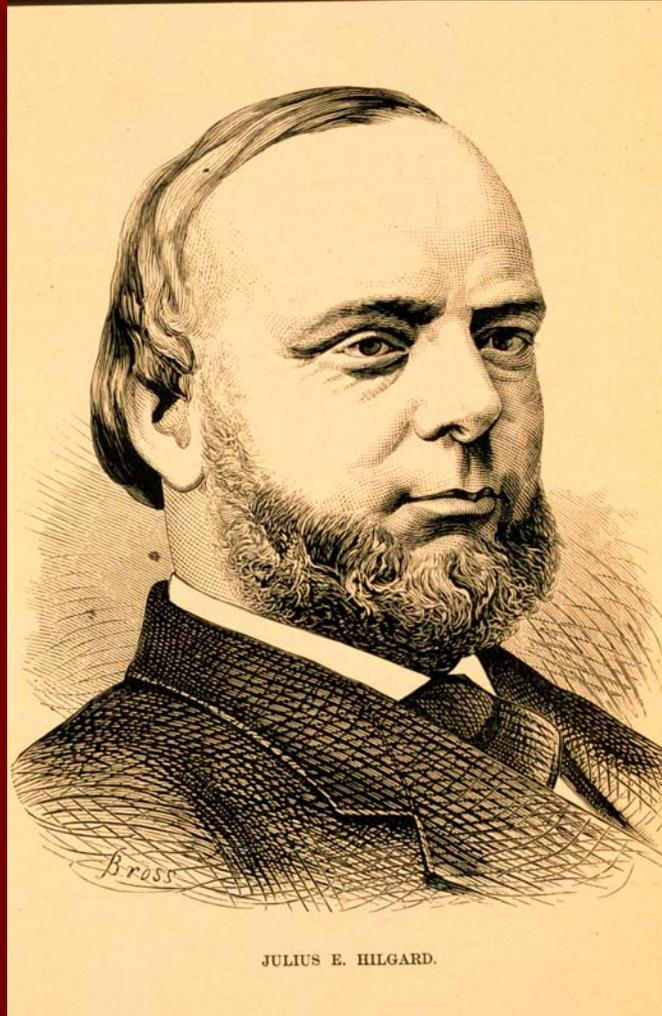
“At that time Bache, the Superintendent, at the age of 37, Hilgard at 23, and Schott at 22, formed a trio of young men by whom the Survey was to be molded into its present shape”.

Cleveland Abbe, *Biographical Memoir of Charles Anthony Schott 1826-1901* (1915)

Charles Anthony Schott (1826-1901)

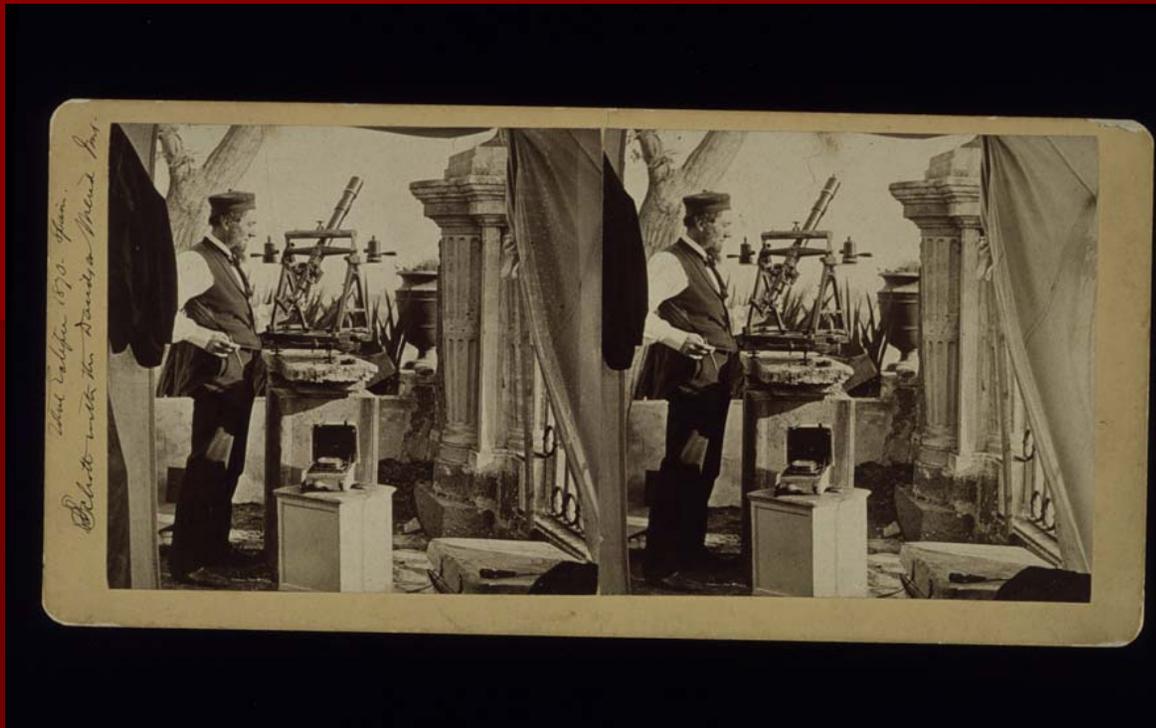


Julius Hilgard (1825-1893)



Schott's Life and Mind

- Born 1826 in Mannheim
- 1840 sent to the Polytechnic School in Karlsruhe
- 1848 left for America, soon joined the Survey
- 1855 Head of the Computing Division for the next 45 years, but worked as well in every branch of the earth sciences, for many institutions and societies
- 1901 Worked at the Survey until the day before he died



- “In those days it was a physical relief and an intellectual advantage to escape from office work in the summer months and devote that season to the field work and the pure air implied in hydrography and geodesy”. --Abbe, 1915

The drive for Methods and Instruments

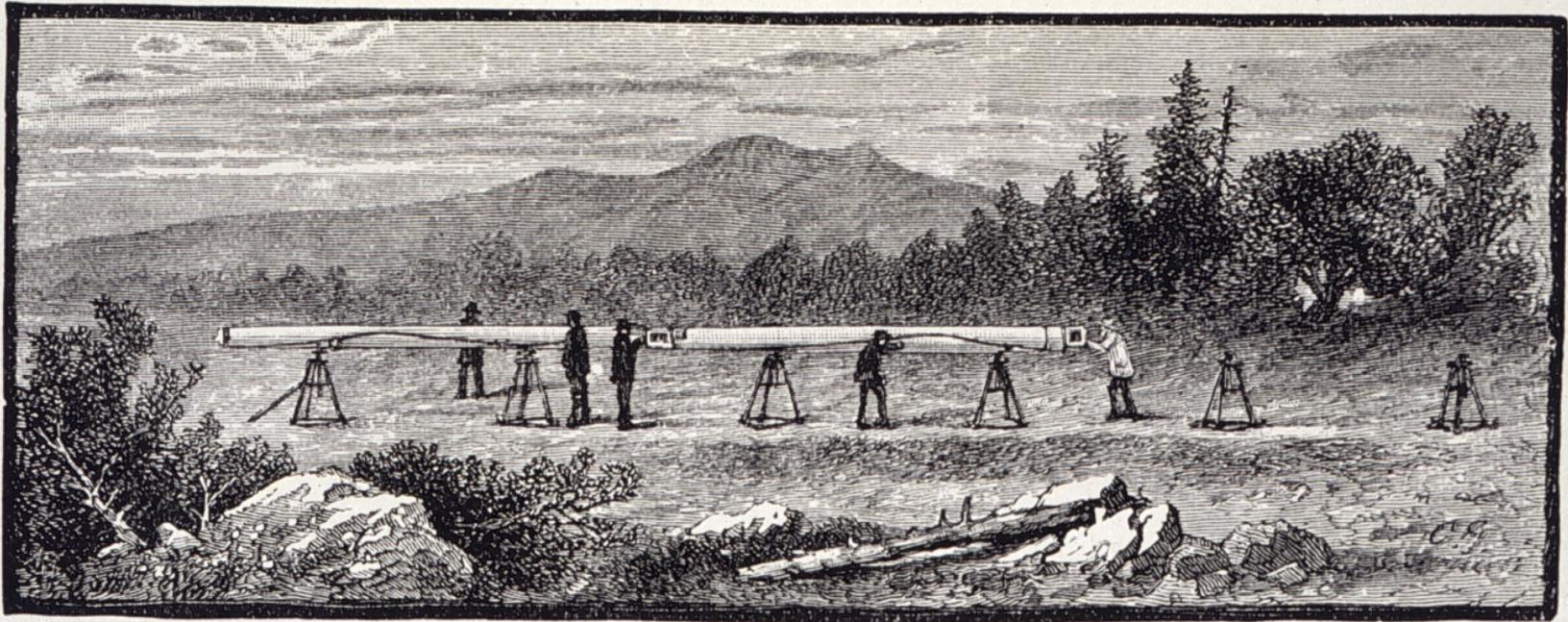
“I believe that the careful examination of observations reveals another law of error...On this account it is in vain to attempt the comparison of the distribution of errors with the law of least squares to too great a degree of minuteness; and on this account *there is in every species of observation an ultimate limit of accuracy beyond which no mass of accumulated observations can ever penetrate*. A wise observer, when he perceives that he is approaching this limit, will apply his powers to improving the methods, rather than to increasing the number of observations”.

Benjamin Peirce, *"Report upon the Determination of Longitude by Moon Culminations"* 1854

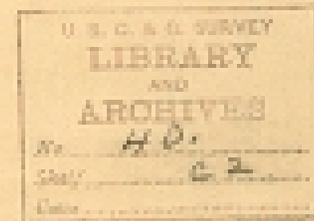
“German” Contributions to the US-Küstenvermessungsbehörde

- Rigorous polytechnic educations
- Fluency in all major scientific languages
- International (i.e., European) approaches to science
- Superb instrument making skills and methods
- Sophisticated printing, engraving, and lithographic skills
- Advanced numerical analysis and computing, particularly via least squares adjustments

William Würdemann's Compensated Baseline Bars



APPARATUS FOR MAKING AND BREAKING CONTACT IN MEASURING BASE-LINE.



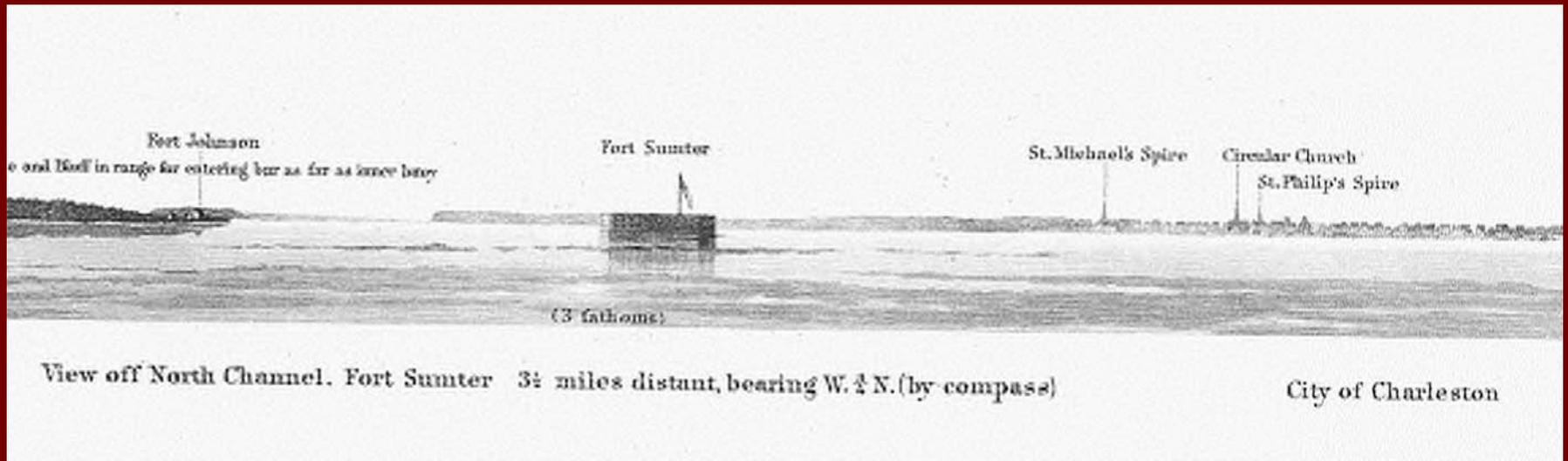
MAP
OF THE
DISCOVERY of the EAST COAST
OF THE
UNITED STATES

Compiled for the use of the U.S. Coast Survey Office by

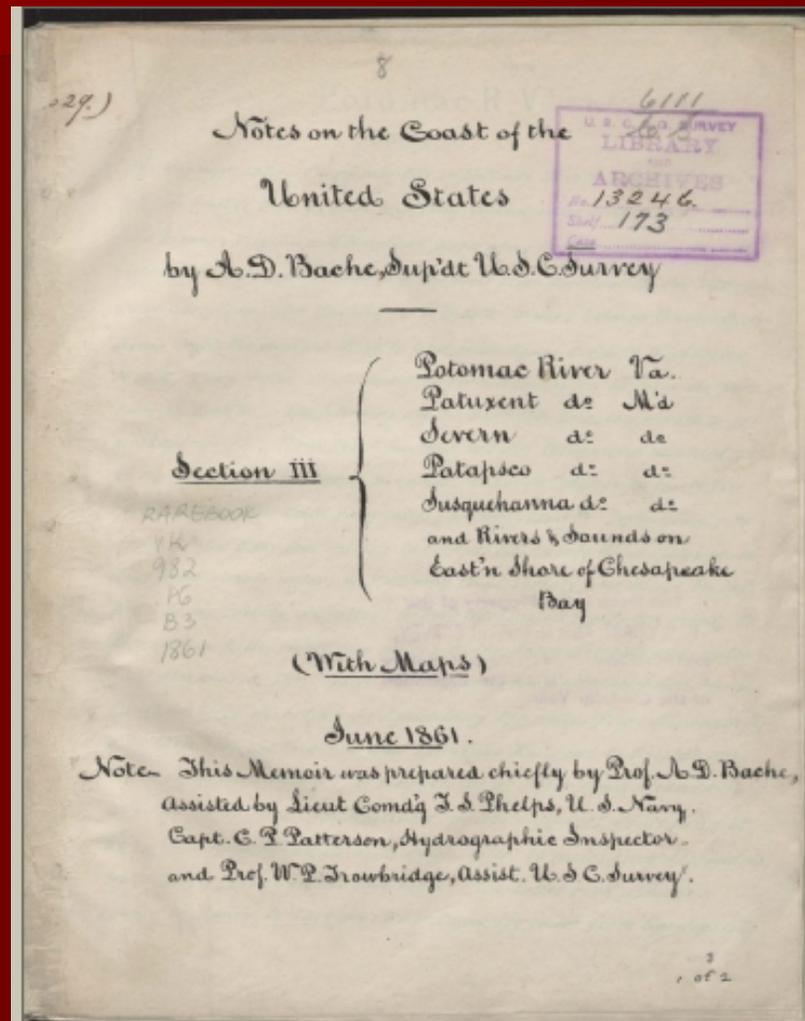
J.G. KOHL.
1856.



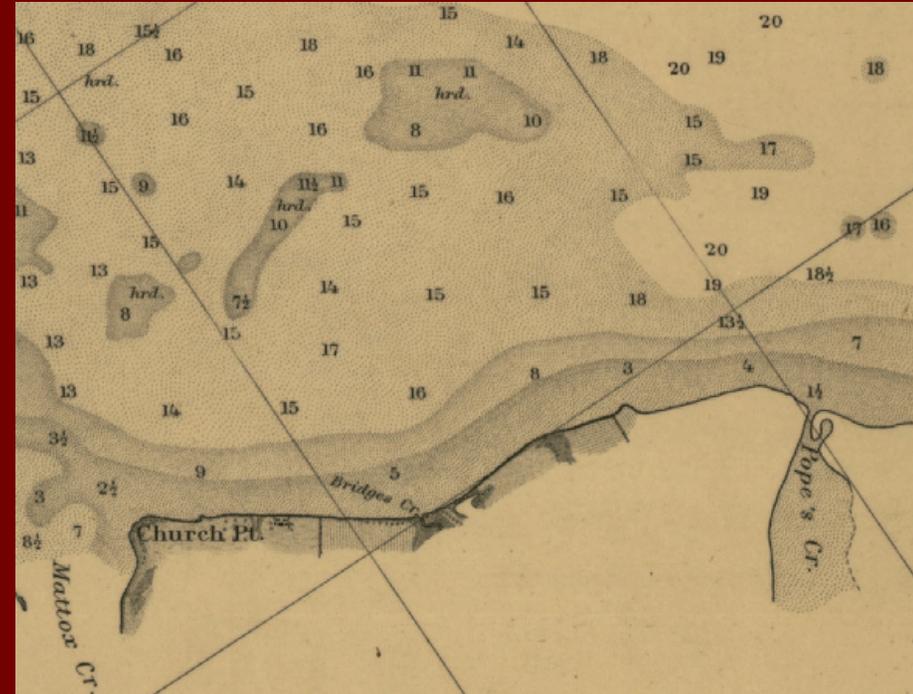
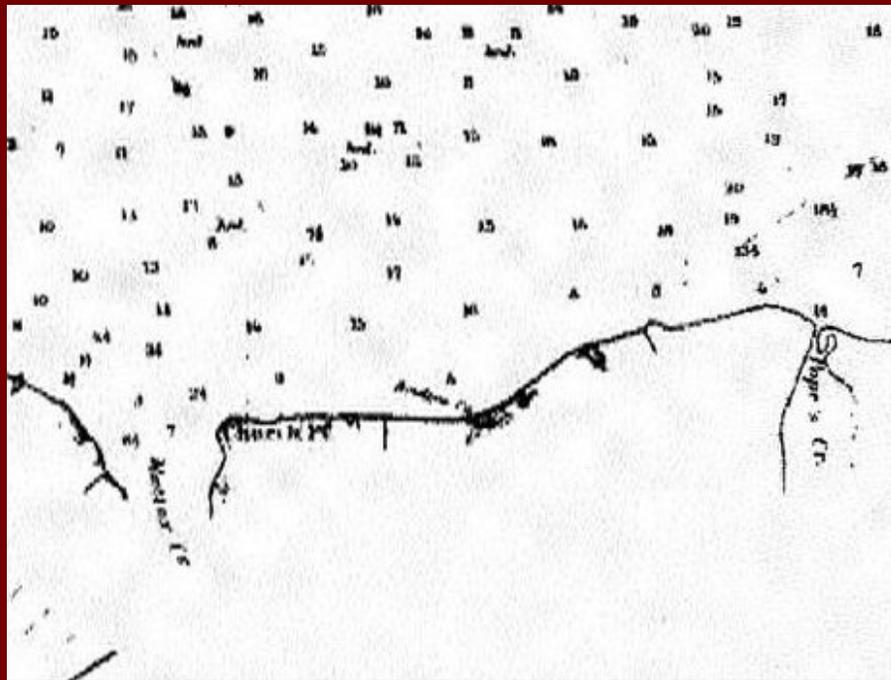
The Gathering Storm



And then the War Came: Bache's "Notes on the Coast"



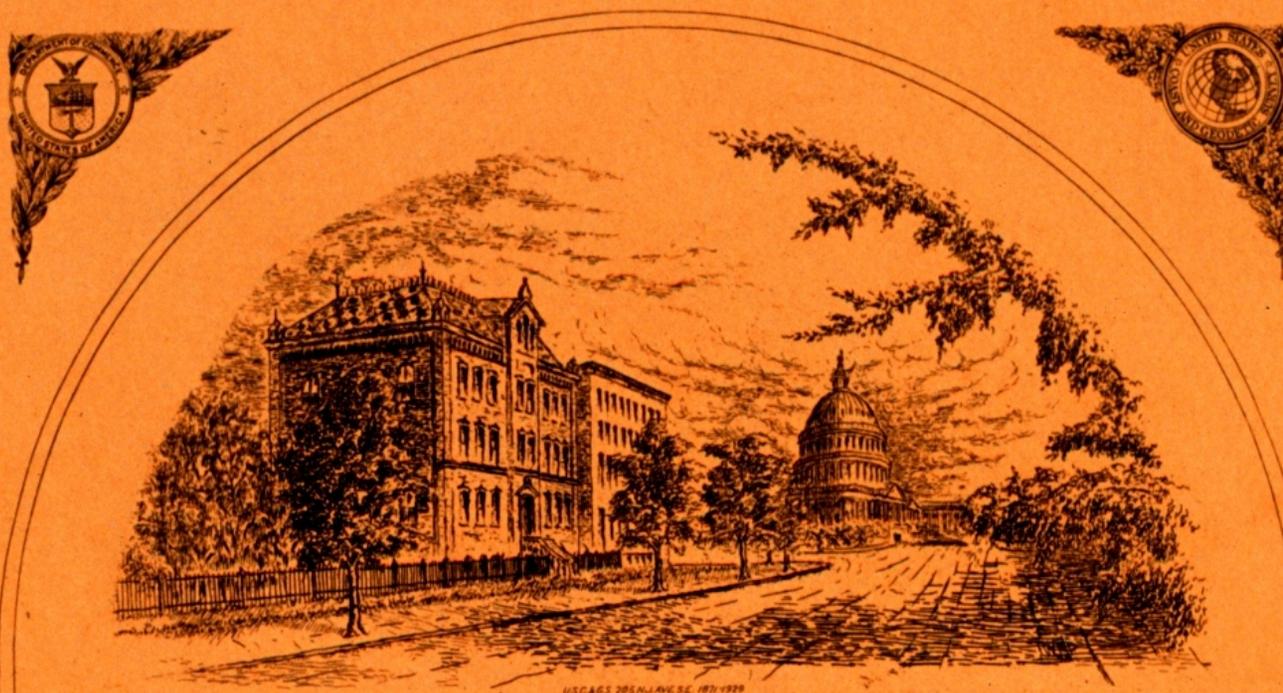
Adolph and Henry Lindenkohl at War



Ferdinand Gerdes, Firing Mortars Geodetically

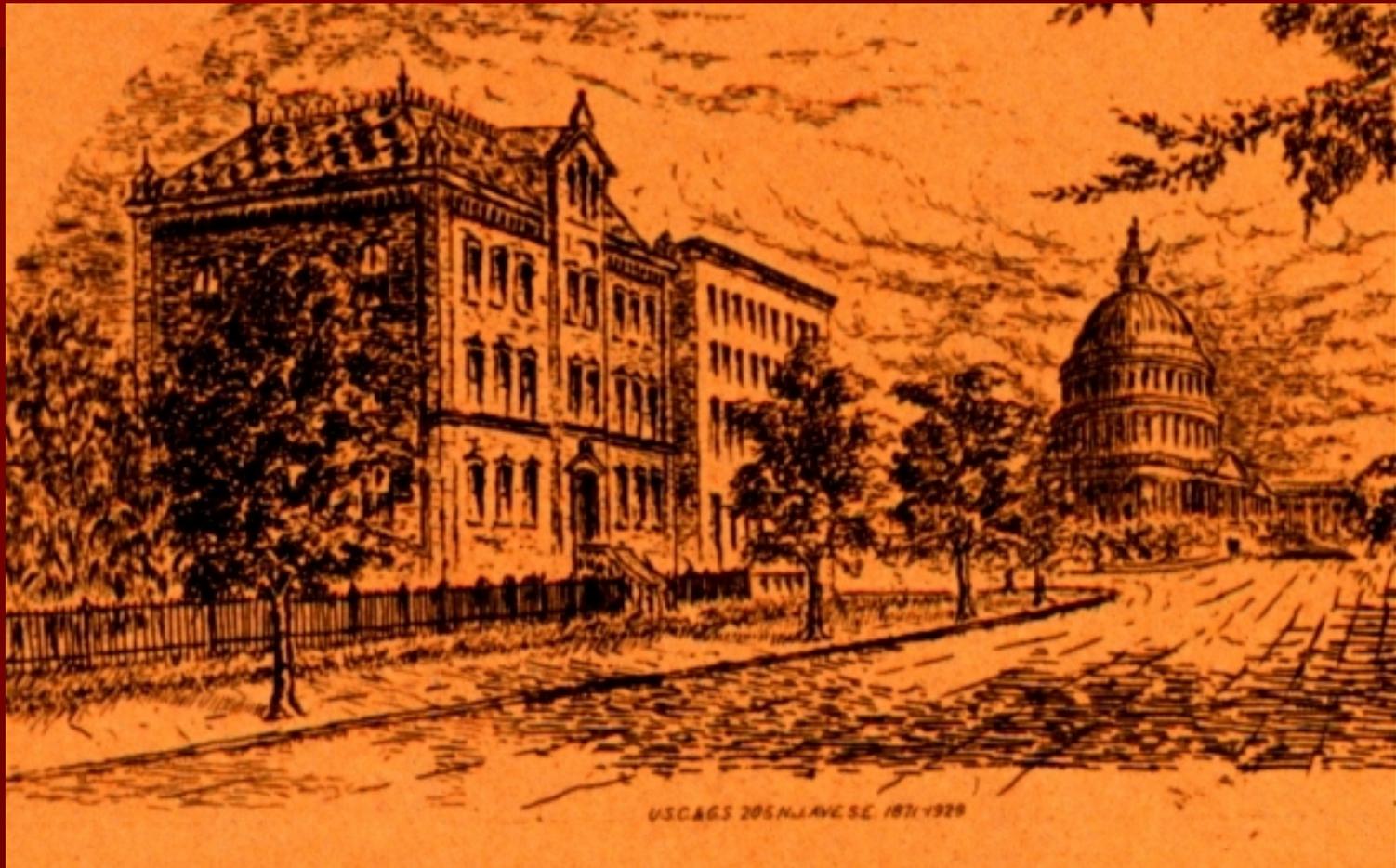


The Survey after the war, and after Bache

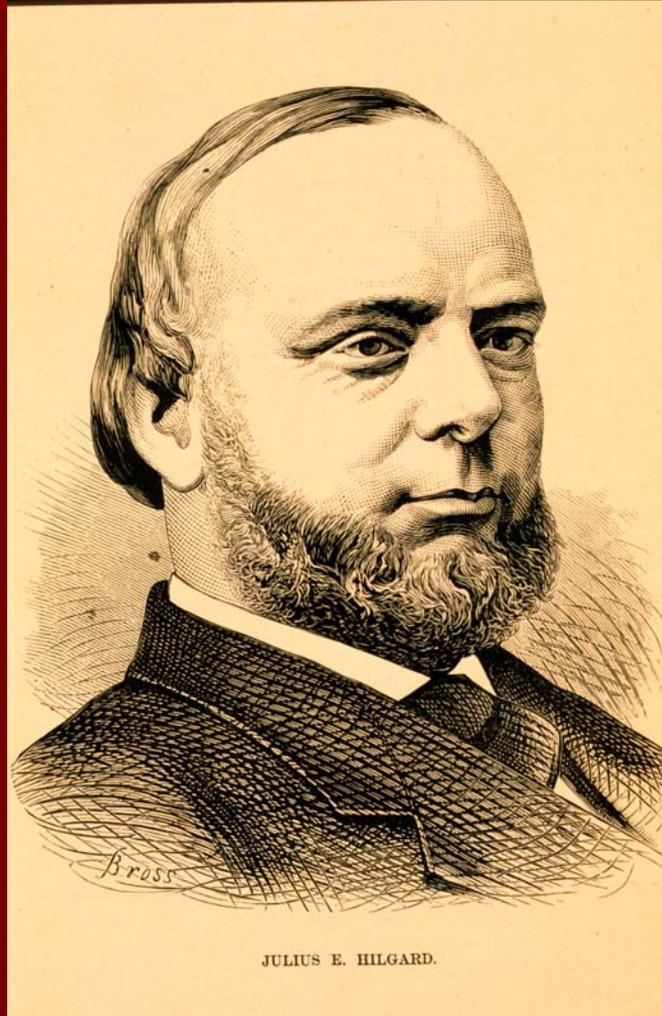


The U.S. Coast and Geodetic Survey

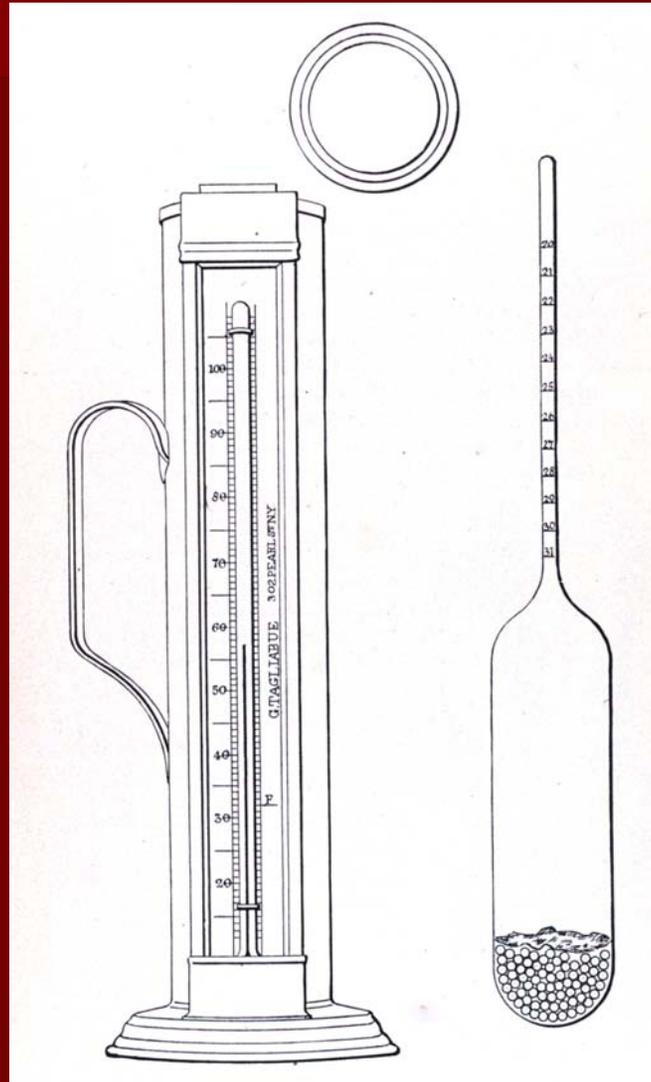
The Survey in and of Washington



Julius Hilgard:
Designer of Instruments
and Survey Leader—until he wasn't



Hilgard's Salinometer



Schott working at the Smithsonian

Julius Bien, Lithographer.
P.O. Box 2257 16 & 18 Park Place.
New York, January 22^d 1875

Chas. A. Schott Esq.

Dear Sir:

I have received your note with the correction for mean temperature chart which will be carefully made. The other correction you refer to has not yet been received from the Smithsonian.

It gives me very great pleasure to learn that you are satisfied with the work, after all appreciation from the right sources is the only true reward for conscientious labor.

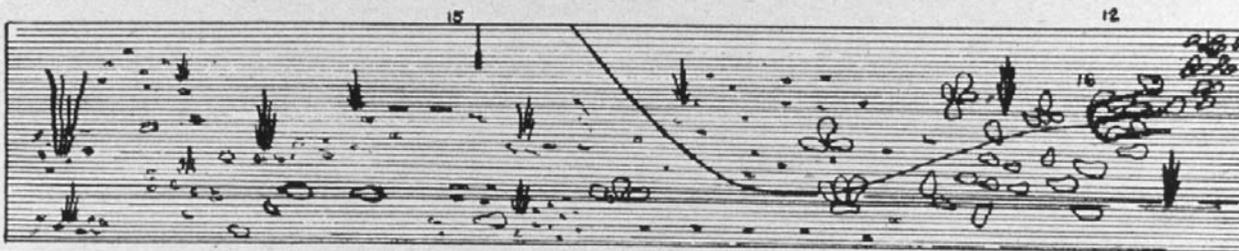
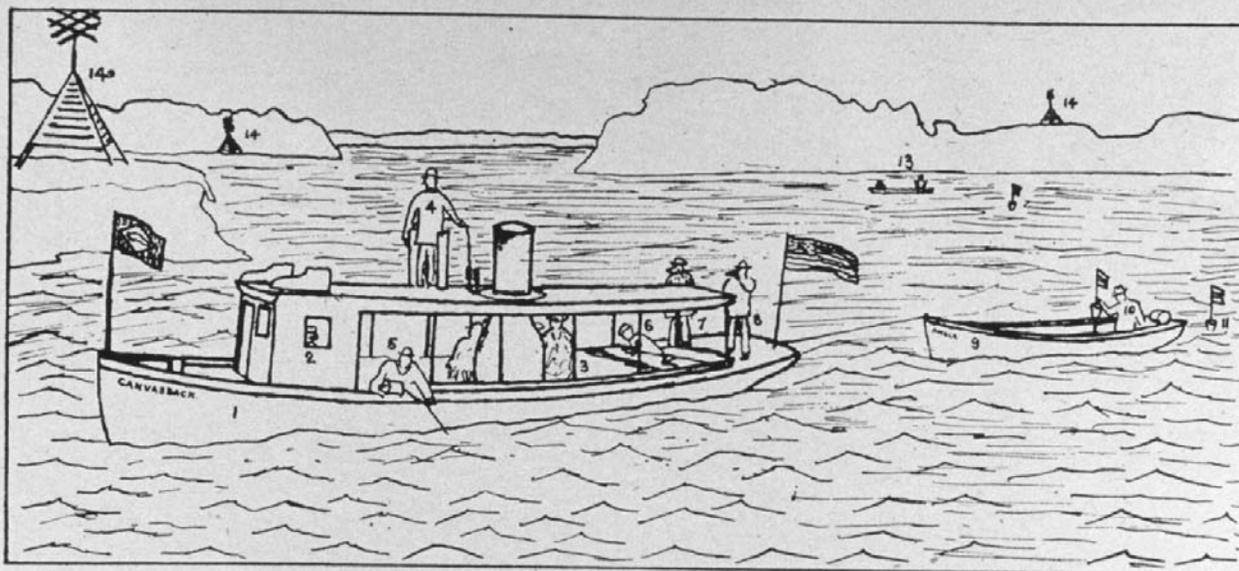
Yours truly
Julius Bien

Julius Bien to Schott, 1870

“I have received your note with the correction for mean temperature chart which will be carefully made. The other correction you refer to has not yet been received from the Smithsonian.

“It gives me great pleasure that you are satisfied with the work, after all appreciation from the right sources is the only true reward for conscientious labor”.

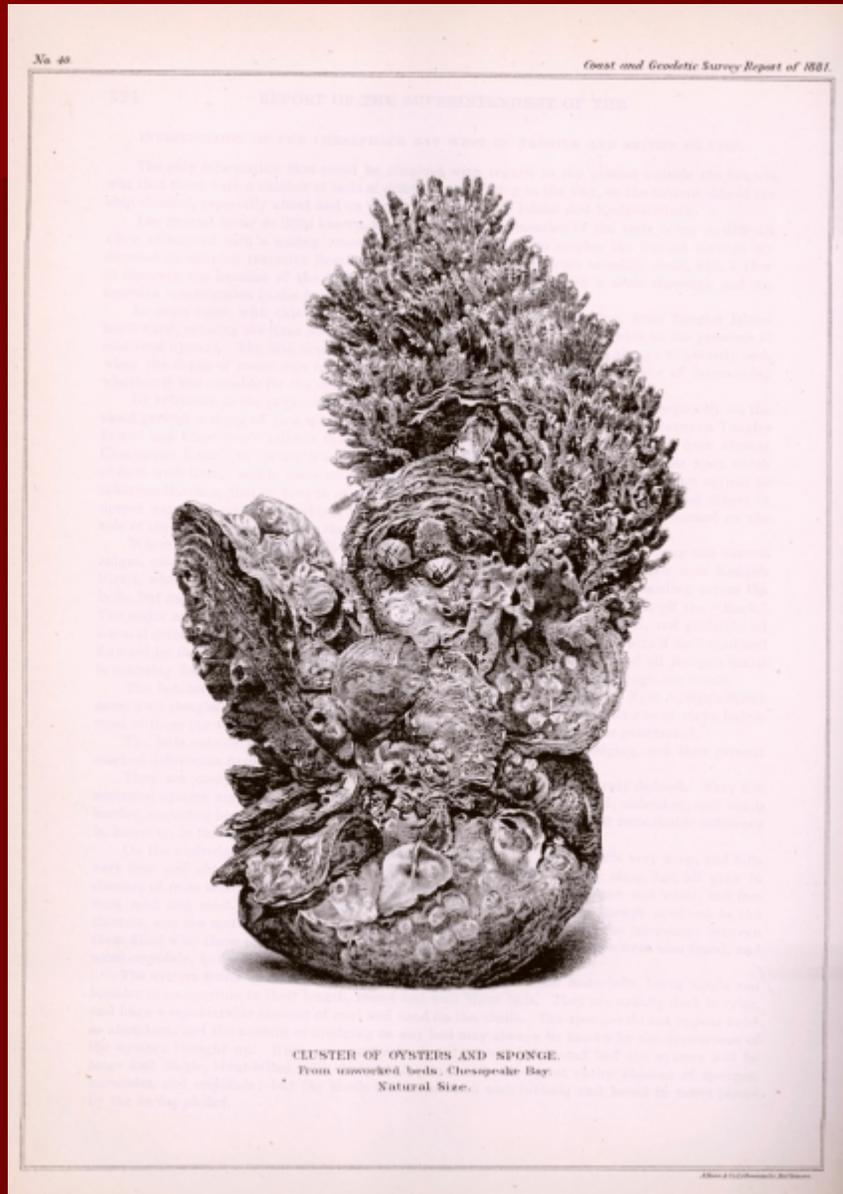
The Oyster Surveys



SKETCH ILLUSTRATING METHODS OF CONDUCTING THE SURVEY OF THE OYSTER GROUNDS OF MARYLAND.

1. LAUNCH "CANVASBACK" (SURVEY BOAT).
2. COXSUAIN.
3. MACHINIST.
4. LEADSMAN.
5. LOCAL OYSTERMAN ATTENDING CHAIN-WIRE APPARATUS.
6. RECORDER.
- 7 AND 8. HYDROGRAPHIC ENGINEERS.
9. WATCH BUOY BOAT.
10. WATCH BUOY TENDER.
11. WATCH BUOY MARKING STATION FOR EXAMINATION.
12. RELIEF OF RIVER BOTTOM.
13. LAUNCH "INVESTIGATOR" ANCHORED AT STATION FOR EXAMINATION.
14. U. S. COAST SURVEY SHORE STATIONS OVER TRIANGULATION POINTS.
15. LEAD-LINE.
16. CHAIN-WIRE APPARATUS.

German-American Printing

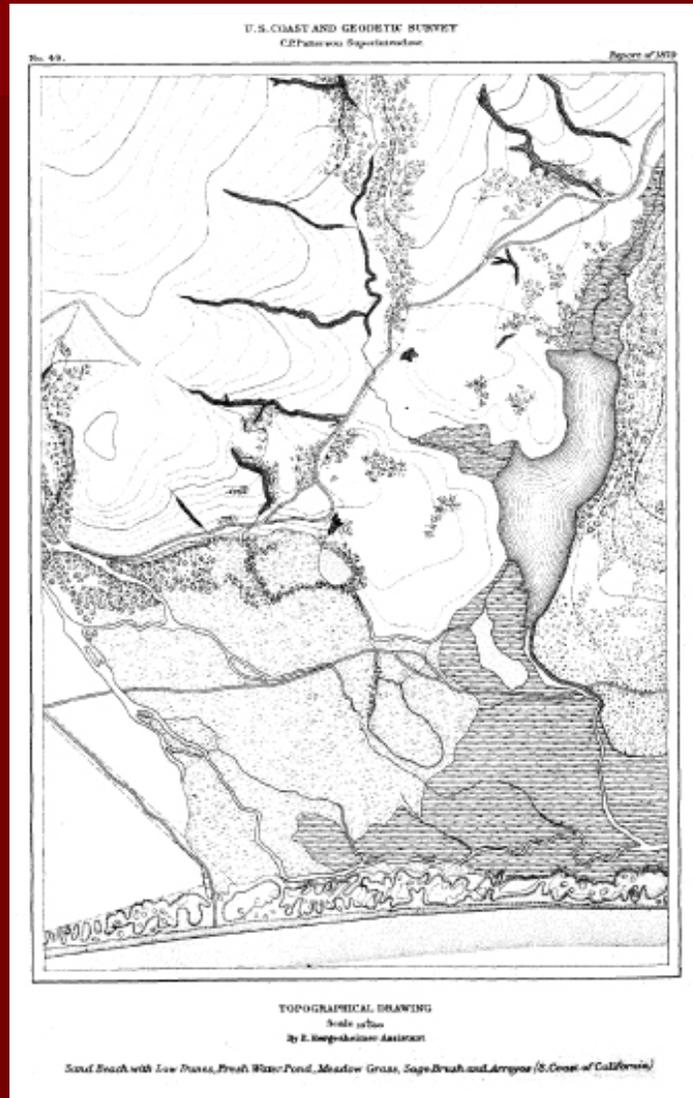


Edwin Hergesheimer



- “A treatise on the plane table and its use in topographical surveying”
- 1880 Report, Appendix 13

Hergesheimer's Topographic Art



Hergesheimer's Legacy



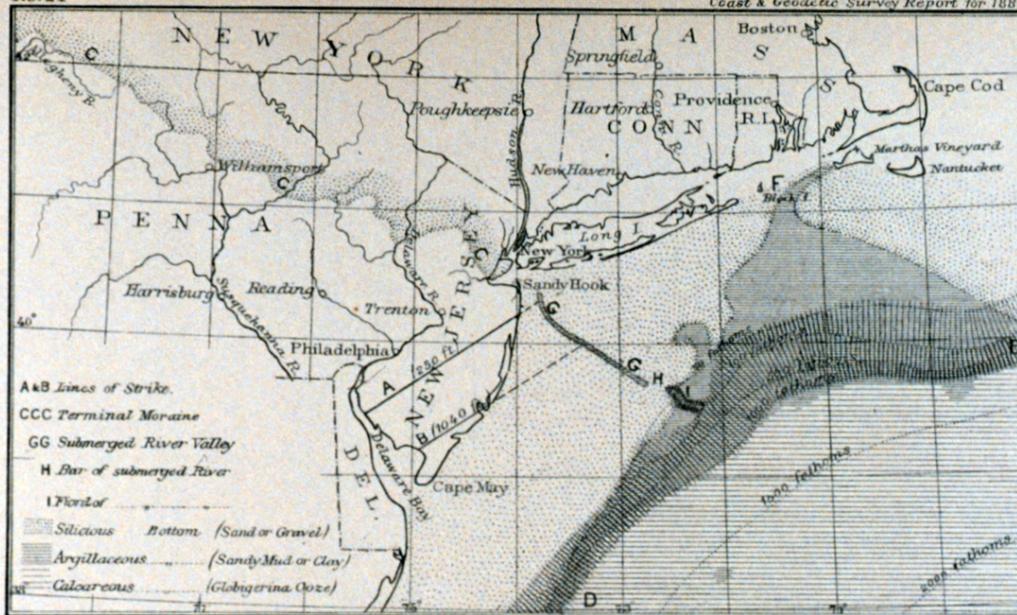
Adolph Lindenkohl ever further out to Sea, 1884

Geology of the Sea Bottom in the Approaches to New York Bay

By A. Lindenkohl.

No. 24

Coast & Geodetic Survey Report for 1884

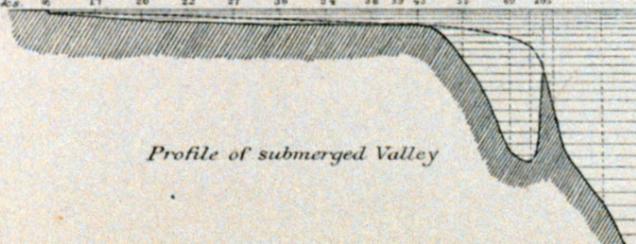


Nautical Miles
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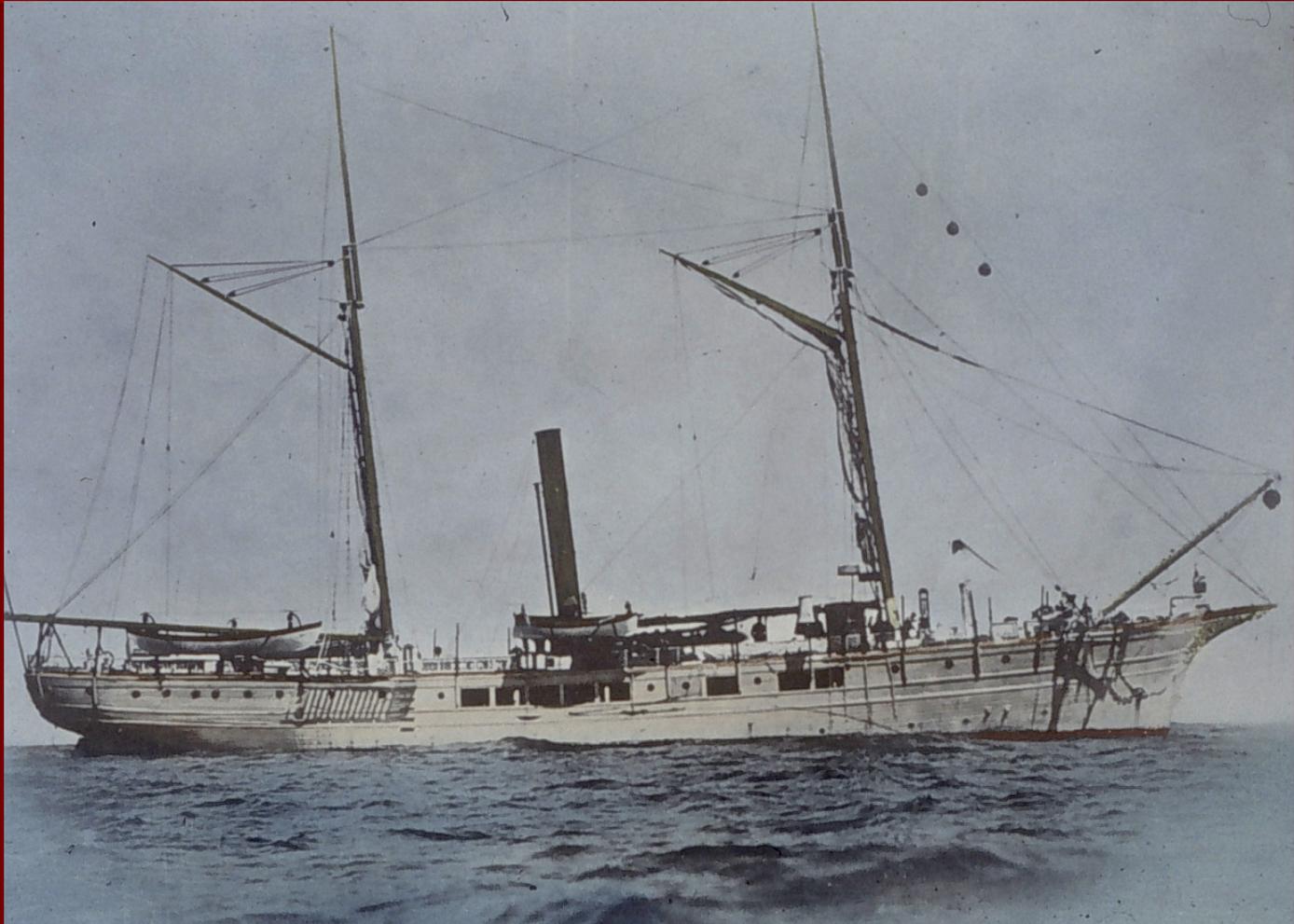
Statute Miles
0 20 40 60 80 100

| | X | XV | XXX | XL | L | LX | LXX | LXXX | XG | C | CX | CXX | CXXV | naut miles |
|-------------------------|----|----|-----|----|----|----|-----|------|----|-----|-----|-----|------|------------|
| Dist. from Sandy Hook | 25 | 35 | 37 | 42 | 41 | 43 | 43 | 41 | 43 | 186 | 450 | 474 | 515 | 600 |
| Depth of Channel | 17 | 20 | 22 | 27 | 30 | 34 | 38 | 39 | 43 | 55 | 60 | 295 | 1000 | fathoms |
| Depth of adjacent Banks | | | | | | | | | | | | | | |

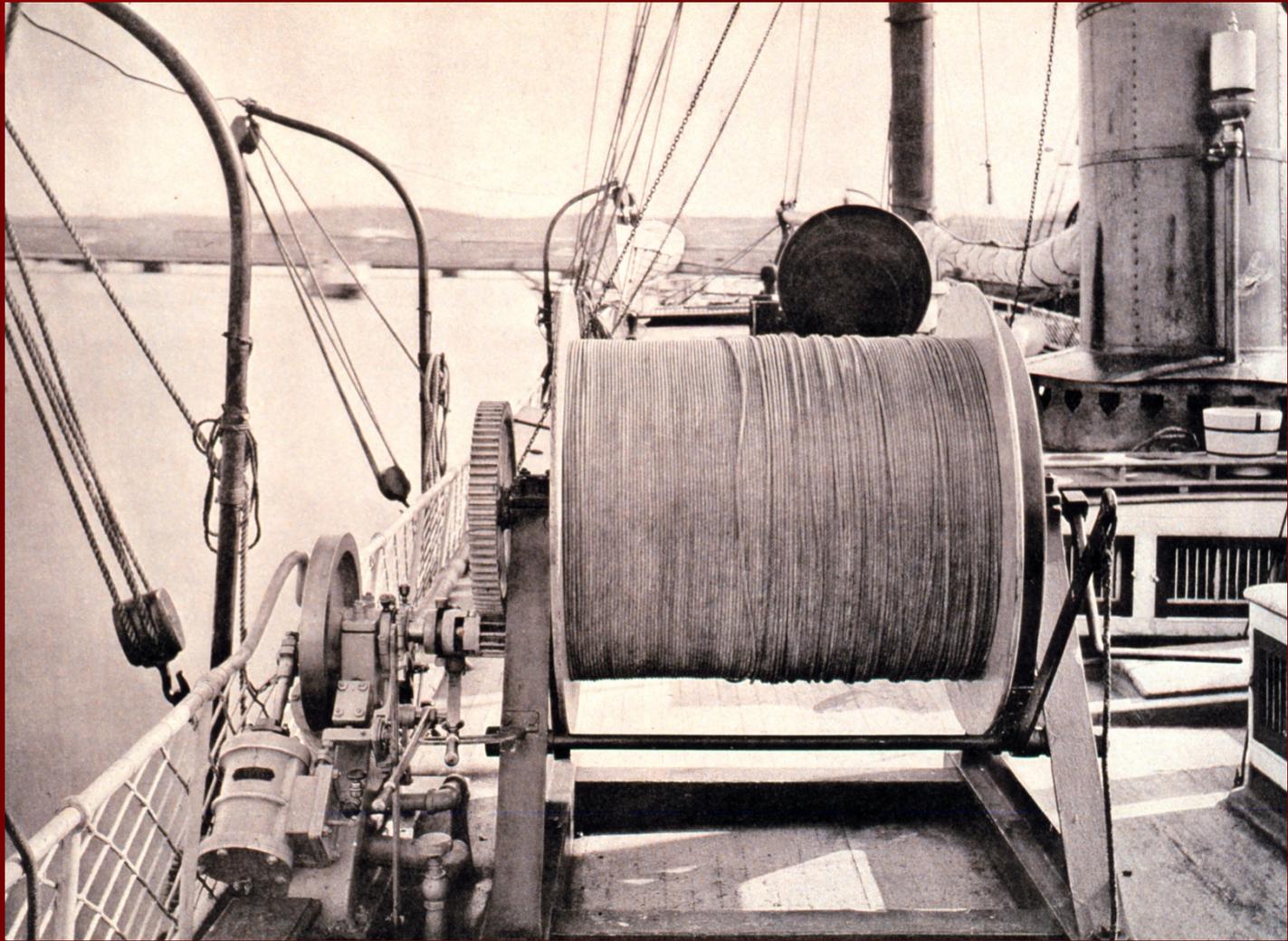
Profile of submerged Valley



Werner Suess, “Report on the Siemens
electrical deep-sea thermometer,
aboard the Blake”, 1882



The Deep Ocean emerges by wire



William Eimbeck in the Mountains

Coast and Geodetic Survey—Transcontinental Triangulation

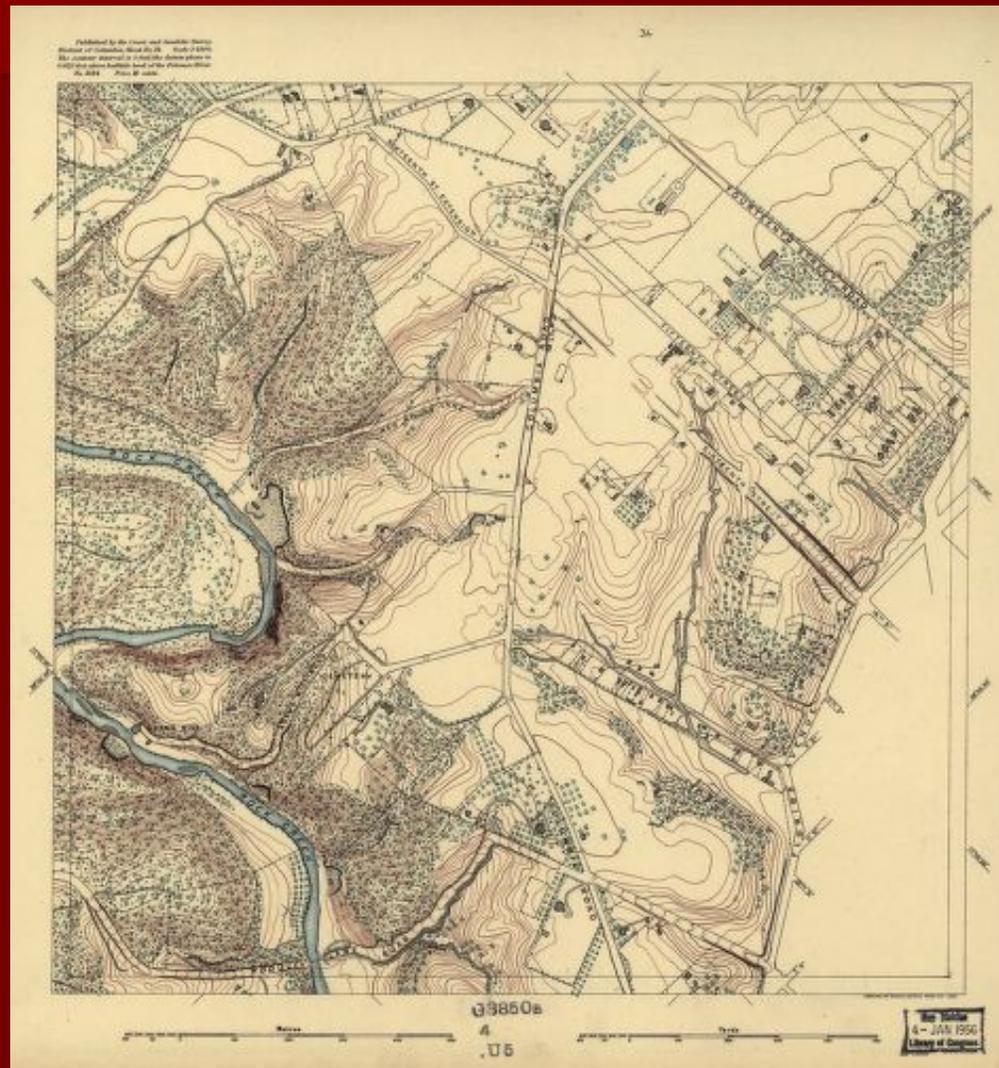
No. 41



HIGH SUMMIT STATION, TUSHAR MOUNTAIN, UTAH, SHOWING RING WALL AND DOUBLE SHELTER TENT AGAINST STORMS AND RADIATION OF HEAT.

Altitude, 3,702 meters or 12,146 feet.

The Survey's Great Map Series of the District 1892-94



Apotheosis of the Smart Germans, 1894

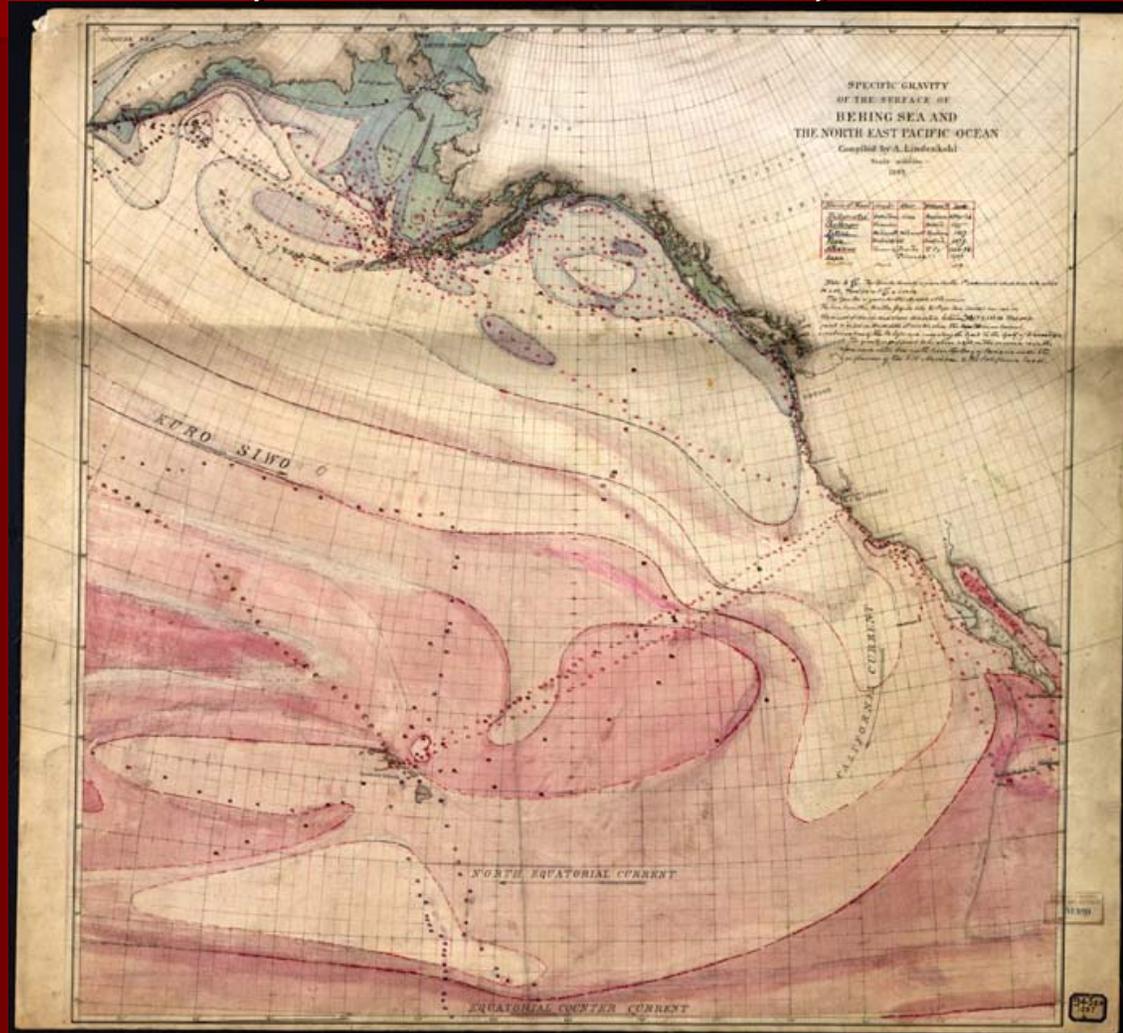


Carlton, A. B. ... C. ... John E. ... William ... A. L. Davis ...

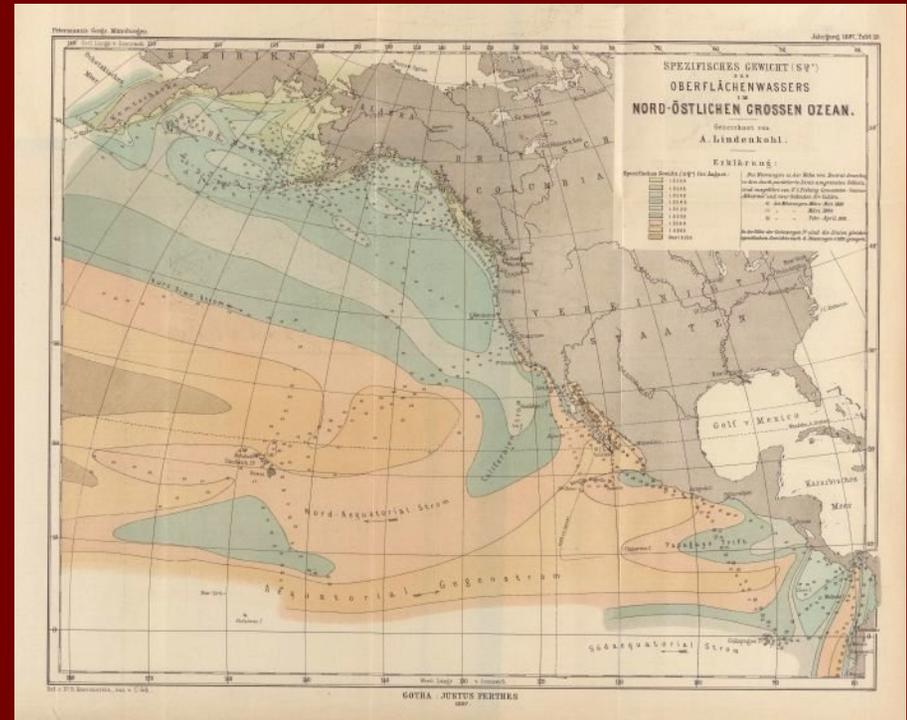
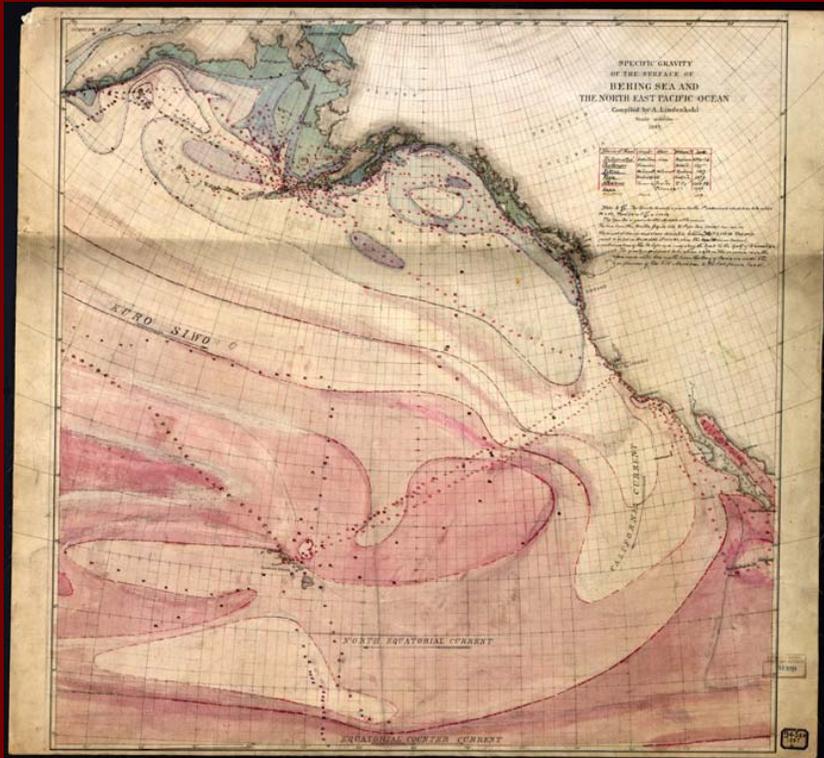
Hilgard's Refractometer for Sea Water Density



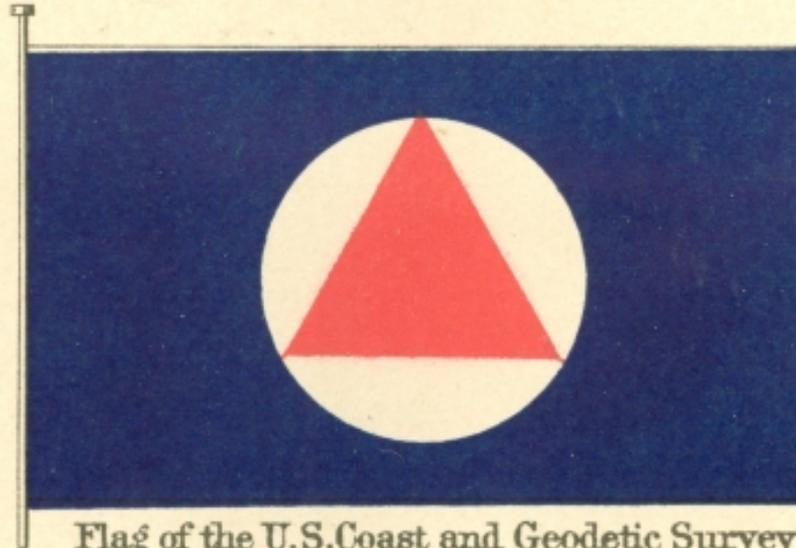
Adolph Lindenkohl's American manuscript map of Specific Gravity of Sea Water, 1897



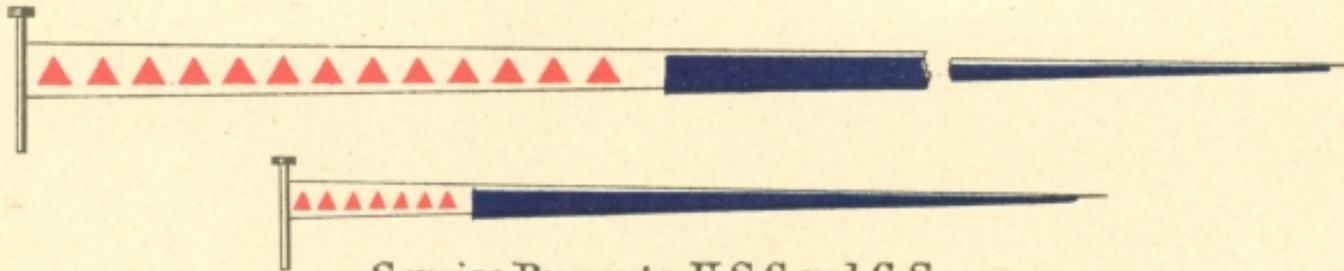
Science in Action



The Flags of the Coast & Geodetic Survey

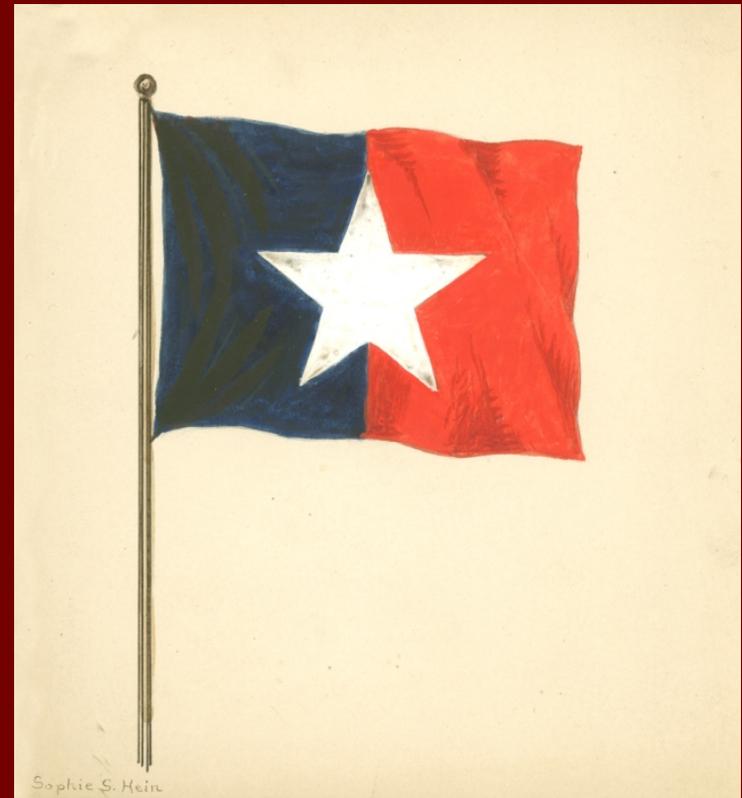
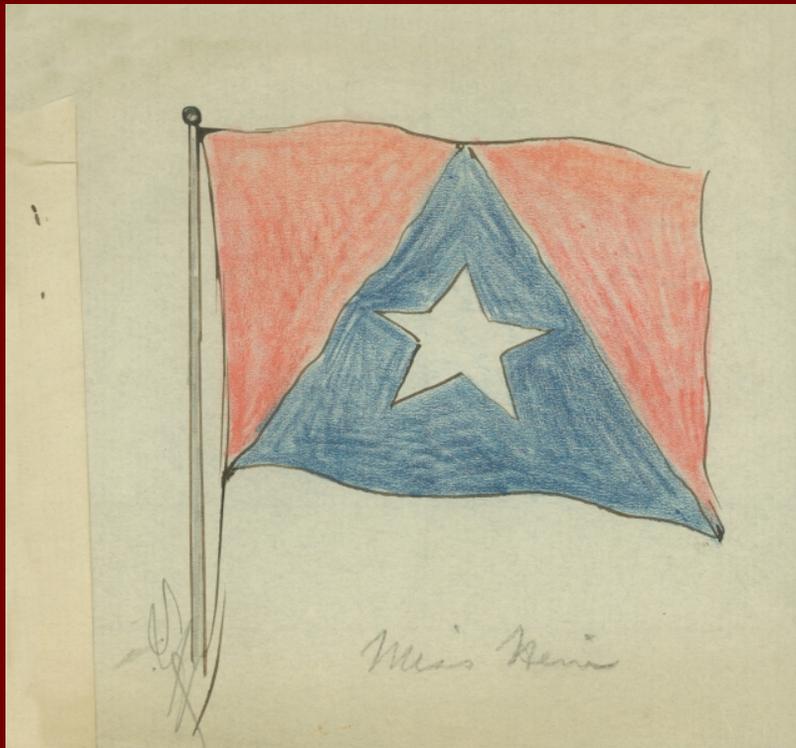


Flag of the U.S. Coast and Geodetic Survey



Service Pennants, U. S. C. and G. S.

The Flags of Sophie Hein





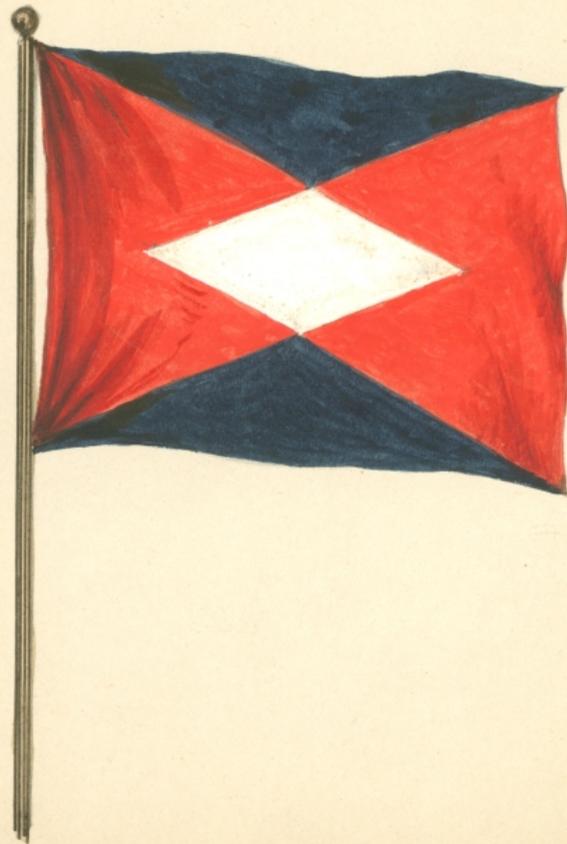
Sophie S. Hein



Sophie S. Hein



Sophie S. Hein.



Sophie S. Hein.

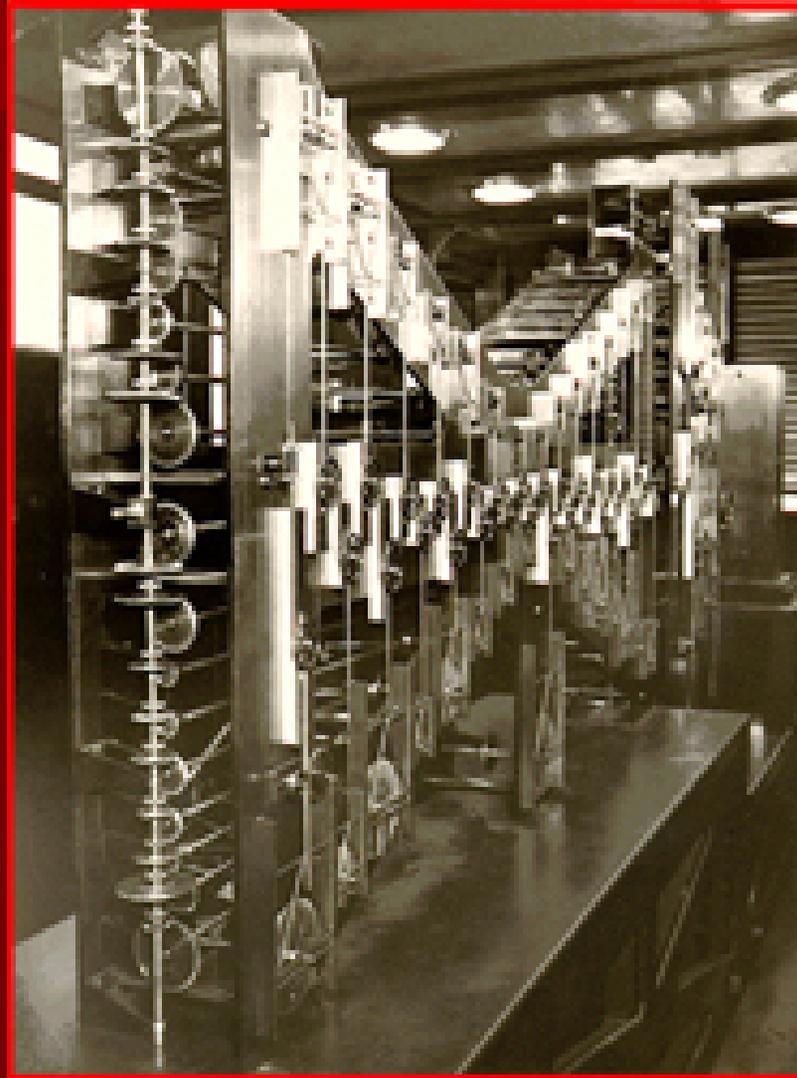
Ahead of Her Time



Ernst Georg Fischer: the Greatest Instrument Maker of the Survey

- 1852 Born in Baltimore
- 1854 moved to Dresden, stayed until 1870, when he returned to the US
- 1887 joined the Instrument Division of the Survey, headed it until his retirement in 1935
- 1922 list: tide gauges, artificial horizon, geodetic levels, standard base bars, standard pendulums, interferometer, astronomical transits, pressure sounding tube, and especially--

The Great Tide Prediction Machine



The Great Tide Predictor at War

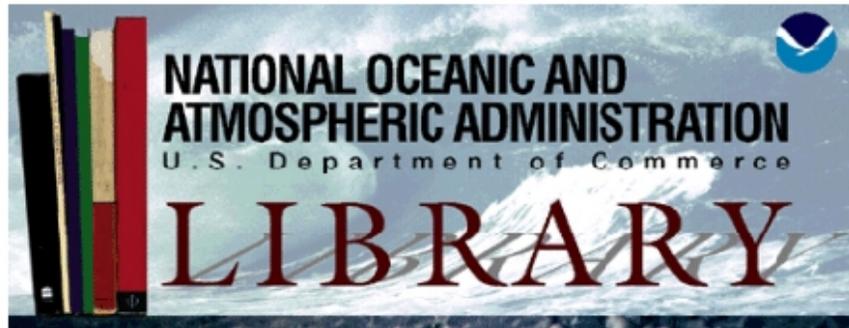


The Legacies of the Survey





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The NOAA History Project 1807-2007: Two Centuries of Science and Service



The banner features the NOAA logo on the left, the text "NOAA HISTORY" in large yellow letters, and "A Science Odyssey" in a script font on the right. Below this is a navigation bar with "Home", "About Site", "Contacts", "NOAA", and "Search" links.



A photograph of a vintage red car with a lizard on its roof. The text "1934 Piffle & Jottings" is overlaid on the right side of the image.

Celebrating 200 Years of America's Science & Service ~ NOAA Legacy ~ 1807 - 2007

NOAA History is an intrinsic part of the history of the United States and the development of its science and commercial infrastructure. ([more](#))

NOAA LEGACY - AMERICA'S OLDEST SCIENCE AGENCY



NOAA Legacy
Although NOAA was formed in 1970, the agencies that came together at that time are among the oldest in the Federal Government.



THEY ABOARD THE SHIP
WOMEN IN THE WEATHER SERVICE DURING WORLD WAR II

HALL OF HONOR

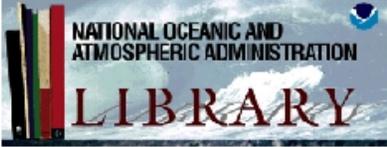
The NOAA Library's Adolph Cluss Project

http://www.lib.noaa.gov/edocs/cluss/sciences.html

KPFA WPFW

NOAA Central Library

Adolph Cluss Exhibition Project



The NOAA Central Library has developed two projects in support of the international exhibition [Adolf Cluss: From Germany to America, Shaping a Capital City Worthy of A Republic](#) (Note: you are leaving a federal government website).

[Progressive Washington and its Progressive Sciences: The Impact of Adolph Cluss](#), will highlight the effect of Adolph Cluss and other progressive and scientific German immigrants on the activities of the Coast Survey and larger American science and society.

[The Earth Jewels of Silver Spring: the Scholarly Treasures of the NOAA Central Library](#), will highlight the library's unique scholarly collections. The library has significant collections of historic German scientific journals often difficult to obtain in Germany because of the impact of two world wars.

Progressive Washington and its Progressive Sciences: The Impact of Adolph Cluss

Although Cluss worked only a short time with the Coast Survey, he was an early participant in waves of progressive and scientifically literate German immigrants who worked with the Coast Survey and also contributed to the local and national cultures in the 19th century. These German immigrants and their contributions include:

- [Adolf Cluss](#)
- [Adolph Lindenkohl](#)
- Ernst Fischer
- Julius Erasmus Hilgard